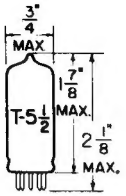
**TUNG-SOL**

# PENTODE

MINIATURE TYPE

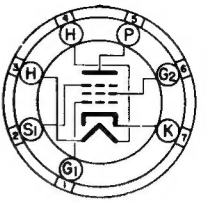



GLASS BULB

COATED UNIPOTENTIAL CATHODE

HEATER
6.3 VOLTS 0.3 AMP.
AC OR DC

ANY MOUNTING POSITION




**BOTTOM VIEW**
MINIATURE BUTTON
7 PIN BASE
7BK

THE 5749/6BA6W IS A RUGGEDIZED, REMOTE CUT-OFF PENTODE VOLTAGE AMPLIFIER OF THE SEVEN PIN MINIATURE CONSTRUCTION. IT HAS EXTREMELY LOW GRID-PLATE CAPACITANCE AND HIGH TRANSCONDUCTANCE TO PERMIT EFFICIENT OPERATION IN SUCH APPLICATIONS AS RF AND IF AMPLIFIERS. CONTROLS ON THE PRODUCT AVERAGE FOR SUCH CHARACTERISTICS AS HEATER CURRENT, PLATE CURRENT, SCREEN GRID CURRENT AND TRANSCONDUCTANCE ASSURE THAT THESE CRITICAL CHARACTERISTICS WILL REMAIN WELL CENTERED. SINCE IT MUST BE ABLE TO WITHSTAND SEVERE MECHANICAL TESTS TO MEET TEST SPECIFICATIONS, THE 5749/6BA6W IS ESPECIALLY SUITED FOR USE IN MILITARY OR INDUSTRIAL AIRBORNE EQUIPMENT WHICH MAY BE SUBJECTED TO SEVERE SHOCK AND VIBRATION.

## DIRECT INTERELECTRODE CAPACITANCES

| | WITH SHIELD #315 | WITHOUT SHIELD | |
|---|---|---|---|
| MAXIMUM GRID #1 TO PLATE (RATED) | .0035 | .0035 | μμf |
| INPUT (RATED) | 5.5 | 5.5 | μμf |
| MAXIMUM | ---- | 6.6 | μμf |
| MINIMUM | ---- | 4.4 | μμf |
| OUTPUT (RATED) | 5.5 | 5.0 | μμf |
| MAXIMUM | ---- | 6.5 | μμf |
| MINIMUM | ---- | 3.5 | μμf |

## RATINGS

ABSOLUTE MAXIMUM VALUES

| | | |
|---|---|---|
| HEATER VOLTAGE | 6.3±10% | VOLTS |
| MAXIMUM DC PLATE VOLTAGE | 330 | VOLTS |
| MAXIMUM DC GRID #2 VOLTAGE | 150 | VOLTS |
| MAXIMUM PLATE DISSIPATION | 3.3 | WATTS |
| MAXIMUM GRID #2 DISSIPATION | 0.7 | WATT |
| MAXIMUM HEATER-CATHODE VOLTAGE | ±100 | VOLTS |
| MAXIMUM BULB TEMPERATURE | 165 | °C |
| MAXIMUM ALTITUDE | 10 000 | FEET |
| MAXIMUM SHOCK | 450 | G |

## TYPICAL OPERATING CONDITIONS AND CHARACTERISTICS

CLASS $A_1$ AMPLIFIER

| | | | |
|---|---|---|---|
| HEATER VOLTAGE | 6.3 | | VOLTS |
| HEATER CURRENT | 0.3 | | AMP. |
| PLATE VOLTAGE | 100 | 250 | VOLTS |
| GRID #3 VOLTAGE | 0 | 0 | VOLTS |
| SCREEN GRID VOLTAGE | 100 | 100 | VOLTS |

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TUNG-SOL

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## TYPICAL OPERATING CONDITIONS AND CHARACTERISTICS — CONT'D.

CLASS $A_1$ AMPLIFIER

| | | | |
|---|---|---|---|
| CATHODE BIAS RESISTOR | 68 | 68 | OHMS |
| PLATE RESISTANCE (APPROX.) | 0.25 | 1.0 | MEGOHM |
| TRANSCONDUCTANCE | 4300 | 4400 | μMHOS |
| PLATE CURRENT | 10.8 | 11.0 | mA |
| SCREEN CURRENT | 4.4 | 4.2 | mA |
| GRID #1 VOLTAGE, Gm = 40 μMHOS | −20 | −20 | VOLTS |

## CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

$E_f$ = 6.3V, $E_b$ = 250Vdc, $E_{c1}$ = 0Vdc, $E_{c2}$ = 100Vdc, $R_k$[A] = 68OHMS, $E_{c3}$[B]

| | INITIAL | | | | 500 HOUR LIFE TEST | | |
|---|---|---|---|---|---|---|---|
| | INDIVIDUAL MIN. | INDIVIDUAL MAX. | PROD. MIN. | AVG. MAX. | INDIVIDUAL MIN. | INDIVIDUAL MAX. | |
| HEATER CURRENT | 275 | 325 | 289 | 311 | 275 | 325 | mA |
| HEATER CATHODE-LEAKAGE ($E_{hk}$ =±100 Vdc) | --- | 10 | --- | 3 | --- | 10 | μAdc |
| GRID CURRENT ($E_{c1}$=−1.0Vdc, $R_{g1}$=0.25MEG) | --- | −1.0 | --- | −0.2 | --- | −1.0 | μAdc |
| PLATE CURRENT | 8.5 | 13.5 | 9.4 | 12.6 | --- | --- | mAdc |
| TRANSCONDUCTANCE (1) | 3600 | 5200 | 3910 | 4890 | 3000 | 5200 | μMHOS |
| INSULATION OF ELECTRODES[C] ($E_f$ = 6.3V, E(g1−all)= −100Vdc, E(p−all)= −300Vdc) | | | | | | | |
| R(g1−all) | 100 | --- | --- | --- | 50 | --- | MEGOHMS |
| R(p −all) | 100 | --- | --- | --- | 50 | --- | MEGOHMS |
| SCREEN CURRENT | --- | 5.6 | --- | 5.0 | --- | --- | mAdc |
| TRANSCONDUCTANCE (2)[D] ($E_f$ = 5.6V) | 3100 | --- | 3560 | --- | --- | --- | μMHOS |
| Δ AVERAGE TRANS-CONDUCTANCE (1) | --- | --- | --- | --- | --- | 17 | PERCENT |
| TRANSCONDUCTANCE (3) ($E_{c1}$ =−20Vdc, $R_k$ =0, $C_k$ =0) | 5 | 100 | 20 | 60 | --- | --- | μMHOS |
| GRID EMISSION[E] ($E_f$ =7.5V, $E_{c1}$=−25Vdc, $R_{g1}$ =0.5 MEG, $R_k$ =0, $C_k$ = 0) | --- | −1.0 | --- | --- | --- | --- | μAdc |

### SPECIAL REQUIREMENTS

| | MIN. | MAX. | |
|---|---|---|---|
| VARIABLE FREQUENCY VIBRATION[F] ($R_p$ = 2000) | --- | 400 | mVac |
| VIBRATIONAL FATIGUE[G] | --- | --- | |
| MINIATURE TUBE BASE STRAIN[H] (NO VOLTAGES) | --- | --- | |
| STABILIZATION[J] (INTERMITTENT LIFE TEST CONDITIONS OR EQUIVALENT) | --- | --- | |
| SHOCK[K] (HAMMER ANGLE = 30°, $E_{hk}$ = 100Vdc, $R_{g1}$ =0.1 MEG., $C_k$ =0) | --- | --- | |
| POST SHOCK AND VIBRATIONAL FATIGUE TEST END POINTS | | | |
| GRID CURRENT | --- | −2.0 | μAdc |
| HEATER−CATHODE LEAKAGE | --- | 30 | μAdc |
| LOW FREQUENCY VIBRATION | --- | 450 | mVac |
| TRANSCONDUCTANCE (1) | 3000 | --- | μMHOS |
| SHORT AND CONTINUITY[L] | --- | --- | |
| RF NOISE[M] ($E_{sig}$ = 15mVac, $C_k$= 0.2 μf) | --- | --- | |

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TUNG-SOL

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## SPECIAL REQUIREMENTS - CONT'D.

| | MIN. | MAX. | |
|---|---|---|---|
| NOISE AND MICROPHONICS[N] ($E_f$=6.3Vdc, $E_{bb}$=$E_{cc2}$=300Vdc, $E_{cg1}$=200mVac, $R_p$=10,000, $R_k$=200, $R_{g2}$=60,000, $C_{g2}$=2μf) | --- | 200 | mVac |
| LOW FREQUENCY VIBRATION[O] ($R_p$ = 2000) | --- | 300 | mVac |
| INTERMITTENT LIFE TEST ($E_b$=300Vdc, $E_{c2}$=150Vdc, $E_{hk}$=135, $R_{g1}$=0.25MEG. $R_k$=230, $C_k$=0) | --- | --- | |
| HEATER CYCLING LIFE TEST ($E_f$=7.5V, $E_b$=$E_{c1}$=$E_{c2}$=$E_{c3}$=0, $E_{hk}$=135Vdc) | 2000 | --- | CYCLES |
| HEATER CYCLING LIFE TEST END POINTS HEATER—CATHODE LEAKAGE | --- | 20 | μAdc |

## NOTES

[A] THE CATHODE RESISTOR SHALL BE SHUNTED WITH A CAPACITIVE REACTANCE NOT EXCEEDING 3 OHMS AT 60 CYCLES.

[B] TIE GRID #3 TO THE NEGATIVE TERMINAL OF THE CATHODE RESISTOR.

[C] SEE MIL-E-1C 4.8.2

[D] PREHEAT ALL TUBES TO BE TESTED FOR TRANSCONDUCTANCE (2) UNDER THE FOLLOWING CONDITIONS FOR A PERIOD OF 5 MINUTES PRIOR TO TESTING. $E_f$=5.5V, $E_b$=250Vdc, $E_{c1}$=$E_{c3}$=0, $E_{c2}$=100Vdc, $R_k$=68, $R_{g1}$=0.5MEG.

[E] PREHEAT ALL TUBES TO BE TESTED FOR GRID EMISSION UNDER THE FOLLOWING CONDITIONS FOR A PERIOD OF 5 MINUTES PRIOR TO TESTING. $E_f$=7.5V, $E_b$=250Vdc, $E_{c1}$=$E_{c3}$=0, $E_{c2}$=100Vdc, $R_k$=68, $R_{g1}$=0.5MEG. TWO SECONDS SHALL BE THE MAXIMUM TIME BETWEEN PREHEAT AND TEST.

[F] SEE MIL-E-1C 4.9.20.3

[G] SEE MIL-E-1C 4.9.20.6

[H] SEE MIL-E-1C 4.9.6.1

[J] SEE MIL-E-1C 4.7.5

[K] SEE MIL-E-1C 4.9.20.5

[L] SEE MIL-E-1C 4.7.5

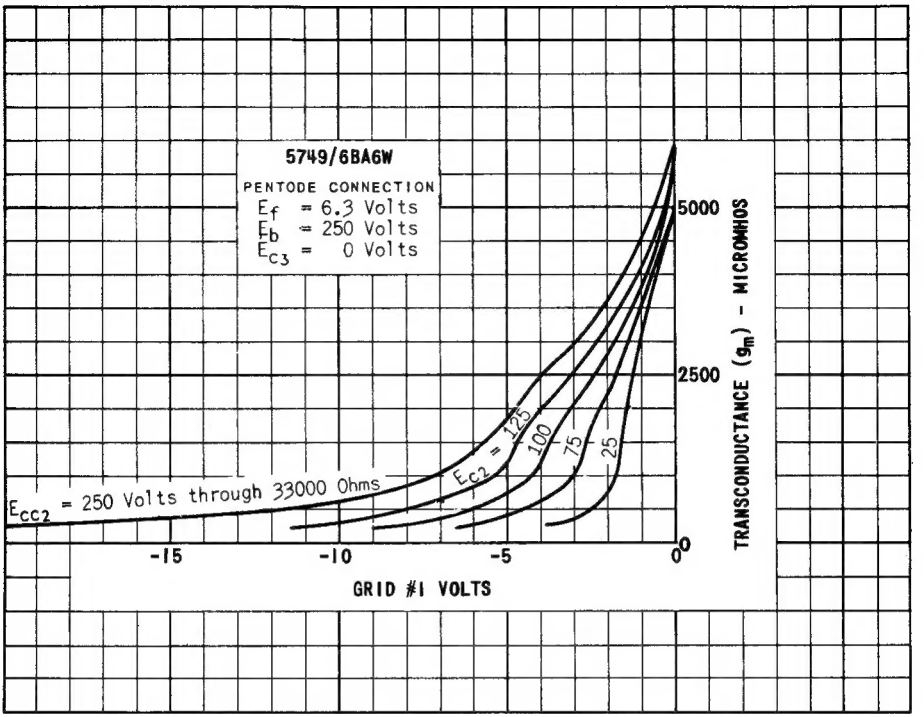
[M] SEE MIL-E-1C 4.10.3.1

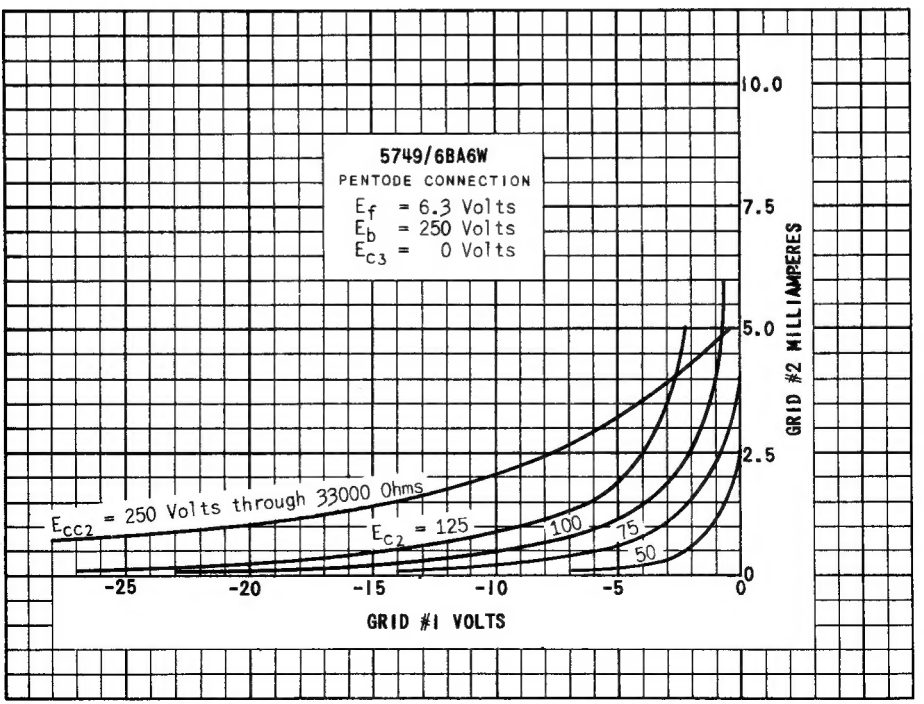
[N] SEE MIL-E-1C 4.10.3.5

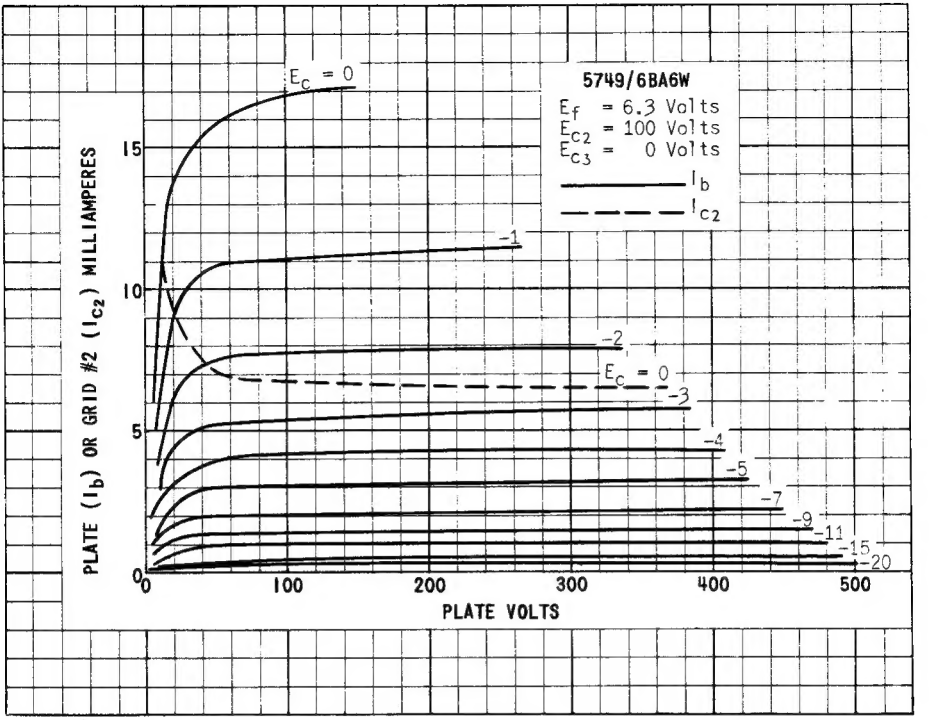
[O] SEE MIL-E-1C 4.9.20.4

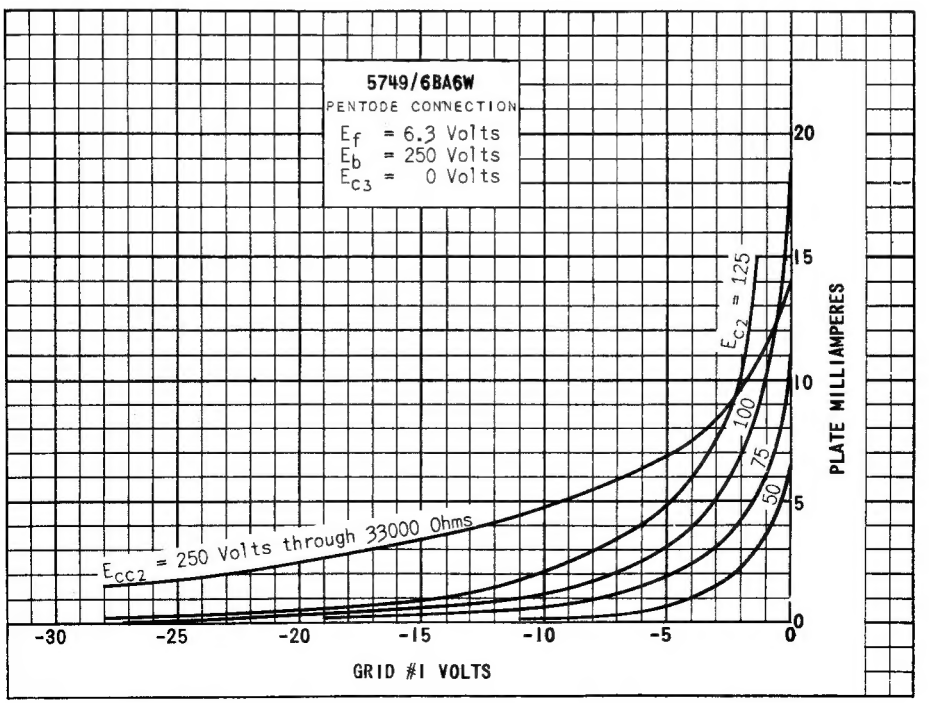
# 5749/6BA6W

PREMIUM TUBE




5749/6BA6W
$E_f$ = 6.3 Volts
$E_{c2}$ = 100 Volts
$E_{c3}$ = 0 Volts
$I_b$
$I_{c2}$
$E_c$ = 0
-1
-2
-3
-4
-5
-7
-9
-11
-15
-20
PLATE ($I_b$) OR GRID #2 ($I_{c2}$) MILLIAMPERES
PLATE VOLTS
0
5
10
15
0
100
200
300
400
500


5749/6BA6W
PENTODE CONNECTION
$E_f$ = 6.3 Volts
$E_b$ = 250 Volts
$E_{c3}$ = 0 Volts
$E_{c2}$ = 125
100
75
50
$E_{cc2}$ = 250 Volts through 33000 Ohms
PLATE MILLIAMPERES
GRID #1 VOLTS
0
5
10
15
20
-30
-25
-20
-15
-10
-5
0